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Indian Standard
SPECIFICATION FOR URINOMETER

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Indian Standard
SPECIFICATION FOR URINOMETER

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(*Continued on* page 2)

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Indian Standard
SPECIFICATION FOR URINOMETER

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 20 April 1967, after the draft finalized by the Medical Glass Instruments and Appliances Sectional Committee had been approved by the Consumer Products Division Council.

0.2 Preparation of standards for surgical instruments, medical equipment and apparatus, including medical glass instruments, has been taken up at the instance of the Advisory Committee for Development of Medical Instruments, Equipment and Appliances of Government of India.

0.3 Great need has been felt for the standardization of glass instruments used in pathological work. This standard, which covers requirements for urinometers, is expected to help in providing uniform equipment to all laboratories.

0.4 Urinometer is a hydrometer intended for measuring relative density of urine.

0.5 This standard is one of a series of Indian Standards on pathological glass apparatus. Other standards in the series are:

IS : 3740-1966 Specification for tubes, glass, for pathological work
IS : 374 1- 1966 Specification for tubes, sedimentation
IS : 3742-1966 Specification for pipettes, dilution, for haemocytometers
IS : 4067-1967 Specification for tube, swab (West type), for throat
IS : 4068-1967 Specification for ureometer, Doremus' type
IS : 4087-1967 Specification for pipette for haemoglobinometer and pipette, blood, biochemical

0.6 In the preparation of this standard, considerable assistance has been derivedfromIND/SL/MED 5845(a) 'Urinometer' published by the Ministry of Defence, Government of India.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard lays down the requirements and methods of test for urinometers used in pathological work.

2. MATERIALS

2.1 The bulb and the stem of the urinometer and the cylinder shall be made from clear, heat-resistant glass (for definitions see IS :1382-1961*). The glass shall have sufficient resisting power against mechanical influences, in particular against scratches, and against corrosion by common chemicals.

2.2 The weighting material shall be clean mercury, lead shots or other suitable heavy material.

2.2.1 The lead shots shall be securely fixed in the lower bulb of the urinometer by means of cementing material so that there is no loose material in the bulb.

2.2.2 If mercury is used, it shall be confined in the lower bulb only.

2.2.3 The cementing material, when used, shall be such as not to soften at 80°C.

2.3 The graduated scale shall be on glazed white paper or any other suitable material.

3. SHAPE AND DIMENSIONS

3.1 The shape and dimensions of the urinometer and the graduated cylinder shall be as given in Fig. 1 and 2.

4. MANUFACTURE, WORKMANSHIP AND FINISH

4.1 The urinometer shall be well annealed, free from bubbles and, as far as possible, free from striae, stones and other visible defects (for definitions see IS :1382-1961*). It shall be hermetically sealed and smoothly finished. The lower bulb shall be so made that the weighting material used inside it does not pass on to the other parts of the urinometer in whatever position the latter is held. The bulb shall be so loaded that the urinometer always floats at all points within the range of the scale, with the stem within 1·5° of the vertical.

4.2 The axis of the stem shall be in line with the axis of the bulb.

4.3 The cylinder shall be well annealed, free from bubbles and, as far as possible, free from striae, stones and other visible defects (for definitions see IS: 1382-1961*). It shall have a wall of uniform thickness, smoothly

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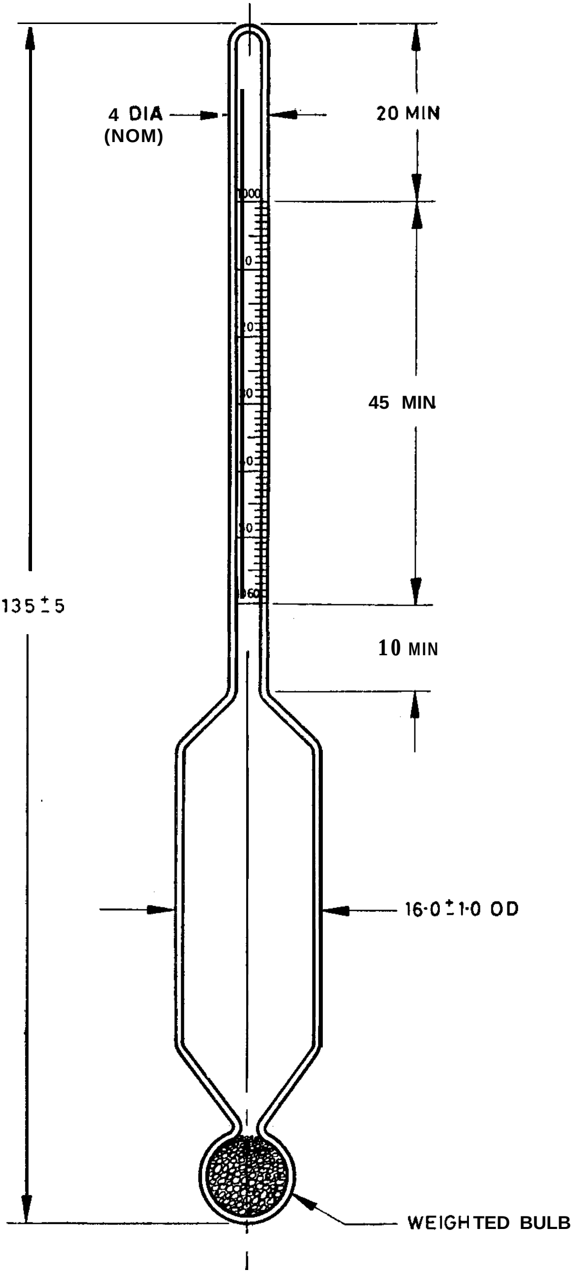
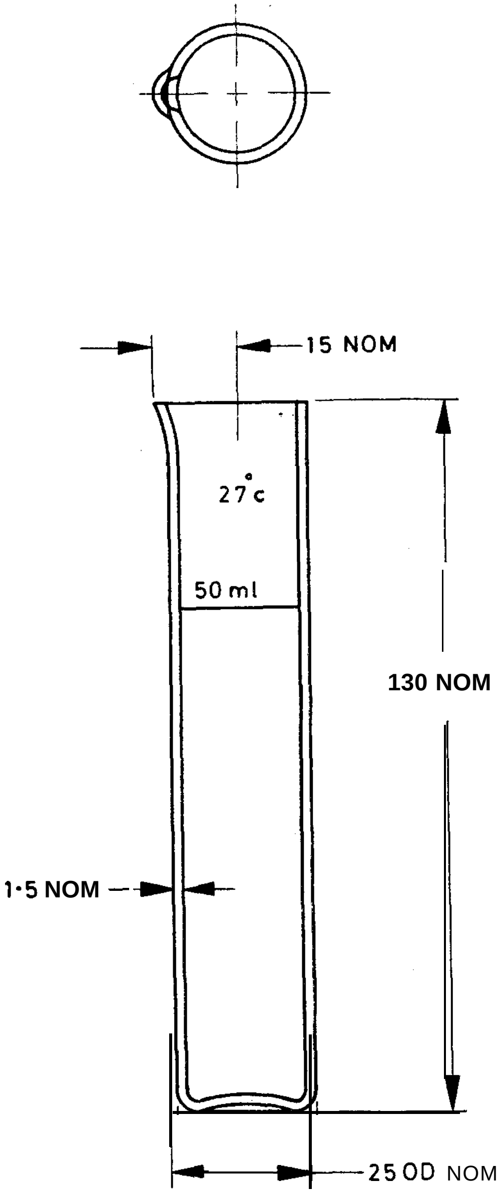
*Glossary of terms relating to glass industry.



All dimensions in millimetres.

FIG. 1 URINOMETER



All dimensions in millimetres.

FIG. 2 URINOMETER, GRADUATED CYLINDER FOR

finished with the top edges well rounded off. It shall stand firmly without rocking. Its axis shall be vertical when standing with its base on a horizontal even surface. It shall not topple over when placed on a surface inclined at 10” to the horizontal. It shall pass the thermal shock test specified in 7.1.

5. GRADUATIONS ON HYDROMETER

5.1 The scale and inscription shall be marked clearly in permanent black ink lines of uniform thickness. The lines shall show no evident irregularities in spacing. The scale shall be straight and without twist, and the graduation lines shall be at right angles to the axis of the urinometer. The thickness of the graduation lines shall be not less than 0·10 mm and not more than 0·20 mm.

5.2 The scale shall be calibrated at 27°C. It shall range from 1·000 to 1·060 and shall be divided into six major divisions by graduation lines, three-fourths the circumference of the stem. The major divisions shall be subdivided into halves and tenths by lines half and one quarter the circumference of the stem respectively.

5.3 The longer graduation marks shall extend beyond the shorter ones on the left of the scale only. On the right of the scale, the ends of all graduation marks shall be vertically above one another. The numbers shall be on the left of the scale, immediately above the graduation marks to which they relate and shall not touch or intersect any graduation mark. The numbering shall be as given in Fig. 1.

6. PERFORMANCE

6.1 The urinometer shall float in an upright position and shall indicate the correct density of the liquid to within ±0·001 at 27°C when floated in distilled water.

7. TESTS

7.1 Thermal Shock Test — The graduated cylinder shall be first boiled in water for 30 minutes and then plunged into water at about 20°C. There shall be no chipping or cracking.

8. MARKING

8.1 The urinometer and the cylinder shall be legibly and indelibly marked above the graduations on the scale with the following:

a) Name of manufacturer, his initials or trade-mark; and

b) Symbol ‘ 27°C ’, to indicate that it is calibrated at 27°C.

8.2 Each urinometer and cylinder may also be marked with the IS1 Certification Mark.

NOTE — The use of the IS1 Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by IS1 and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by IS1 for conformity to the standard. Details of conditions, under which a licence for the use of the IS1 Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. PACKING

9.1 Each urinometer shall be packed as given below or as agreed to between the manufacturer and the purchaser.

9.1.1 The urinometer and the cylinder shall be individually wrapped in thin paper and packed in a cylindrical cardboard carton with cottonwool cushioning inside.

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